		NTSB ID: MIA02LA060		Aircraft Registration Number: N777TY	
		Occurrence Date: 02/14/2002		Most Critical Injury: None	
		Occurrence Type: Accident		Investigated By: FAA	
Location/Time					
Nearest City/Place West Palm Beach		State FL	Zip Code 33406	Local Time 0649	Time Zone EST
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Gulfstream Aerospace		Model/Series G-V		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>On February 14, 2002, about 0649 eastern standard time, a Gulfstream Aerospace G-V, N777TY, operated by BB Five Inc., as a Title 14 CFR Part 91 positioning flight landed hard at West Palm Beach International Airport (PBI), West Palm Beach, Florida. Visual meteorological conditions prevailed, and an IFR flight plan was filed. The airplane was substantially damaged. The airline transport rated-pilot and co-pilot reported no injuries. The flight was originating at the time en route to Teterboro, New Jersey.</p> <p>According to the statement of the crew they arrived at the fixed-base-operator (FBO) at 0545, proceeded to the airplane, performed an exterior preflight and found everything "satisfactory." They checked the cockpit, reset all the pulled circuit breakers (CB's), and after a delay of about 5 minutes to allow the co-pilot to retrieve an expense form from a rental car, they started the engines.</p> <p>During taxi to the active runway the crew performed the before takeoff checklists as required. According to the CVR (cockpit voice recorder), at CVR time 11:22, the pilot said "ground spoilers, when do you want them," and the answer was "now." According to Gulfstream, with the ground spoilers armed, the spoilers will come up automatically anytime the throttles are brought to idle and the airplane is on the ground. They are armed on takeoff in case the takeoff is aborted. When the airplane gets airborne, the WOW (weight-on-wheels) switches, located on each main gear, switch to the air mode and inhibit the spoilers from extending in the event the pilot retards the throttle to idle. If the WOW switches remain in the ground mode after takeoff, and the throttles are retarded to idle, the ground spoilers will deploy.</p> <p>According to the crew's statement, after taxi to the active runway the flight was cleared for takeoff at 0645. On takeoff roll all indications were "normal," and after lift-off the landing gear "failed to retract." The crew performed "override procedures," with "no change" in the indication. They then returned the landing gear to the "normal down position" and the checklist was completed for "landing gear failure to retract." They climbed to 2,000 feet and "addressed" the Blue CAS (Crew Alerting System) message "L WOW & R WOW PWR FAIL [Left and right weight-on-wheels power failure]," per the checklist. They reset and checked all CB's with "no change in message." They elected to land, to evaluate the situation on the ground, and performed an ILS approach to runway 27R at PBI.</p> <p>At CVR time 20:03, while on final approach, the pilot said, "...we have three green, spoilers armed." According to the crew, on approach the power levers were retarded "to idle at approximately 15 feet above [the] ground...at that point the aircraft suddenly and abruptly descended to the runway with a very hard landing." According to the FDR (flight data recorder) the ground spoilers deployed at 57.7 feet on the radar altimeter, with a vertical acceleration of 4.25g on impact. At CVR time 21:13, the sound of the airplane impacting the runway was heard. The co-pilot said, "what the...was that...know what it was...spoilers...spoilers deployed...spoilers</p>					
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Narrative (Continued)

deployed."

According to the transcript of communication between N777TY and the local control at Palm Beach Tower the flight was cleared to land at 0647:12. At 0649:06, after landing, the PBI tower controller, asked the pilot of N777TY, "where you parking?" The pilot answered "we're going to need a tow truck out here we blew the right main [tire]." At 0651:41, the tower informed the crew that a tow truck and fire rescue was on the way. The pilot of N777TY said, "we're spilling fuel we blew some mains and aah we're spilling fuel."

According to General Dynamics Aviation Services (GDAS) work order number PBI 3907, opened on February 11, 2002, at 2002, N777TY had been brought to the facility to correct the following discrepancy; "on several occasions climbing out through 2,000 feet 225 kts indicated airspeed got the over speed warning with no other CAS messages." The airplane was on jacks, for a tire change, when a mechanic needed access to the airplane's Maintenance Data Acquisition Unit (MDAU) to check out the problem that the airplane was having with the over speed. Since the airplane was on jacks the mechanic had to disable the WOW switches in order to simulate that the WOW was in the ground mode, not in the air mode, and to gain access to the MDAU. The mechanic said he used a "Popsicle stick" [Note: the words Popsicle stick and tongue depressor are used interchangeable throughout this report] to disable the WOW switches. After the maintenance was completed the sticks were not removed, and the inspector that returned the airplane to service was not aware that the WOW switches had been disabled for any reason to include gaining access to the MDAU, and no notation was mentioned in the work logs. A mechanic and inspector signed off the work order on February 13, 2002, at 0750. (See the copy of the GDAS Inspection/ Maintenance Record, an attachment to this report).

According to the FAA inspector's statement, he arrived at the crash site on February 14, 2002, at 1000. The airplane was still on the runway, and it was lightly raining. The inspector examined the wreckage and said he could see that the "right main gear had been pushed through the wing spilling fuel." He did not notice anything "...unusual about the aircraft at this time." He said that he learned the next day, "that a mechanic had removed from both main gear weight-on-wheels switches pieces of a tongue depressor used to indicate that the aircraft had weight-on-wheels while on jacks." In addition, the FAA inspector stated the flightcrew members "...were violated for missing these pieces [tongue depressors] in the gear [during the pre flight inspection], but later expunged because it was determined that a reasonable person could have misses these," due to the fact they were hidden from view.

The investigation revealed, that two employees of GDAS on the morning of the accident, had gone to the wreckage about 0715, and started taking pictures. One of the GDAS employees asked the other while walking around the airplane, "...if the objects on the landing gear were normal." According to the one employee's statement, "...very surprised I noted the presence of tongue depressors, [and] without thinking I removed the Popsicle sticks off the right gear and rushed to the other side (left landing gear) and found another tongue depressor that I also removed. I showed the findings to [the other employee] who told me to hang on to them and to inform [the operations manager] as soon as we come back to the office." (See the Photo #1, an attachment to this report).

A ground test was performed to validate the integrity of N777TY's Crew Alerting System (CAS) on April 16, 2002, at General Dynamics Aircraft Service's facility, West Palm Beach International Airport, West Palm Beach, Florida, in the presence of the NTSB IIC and FAA. The results of the test showed that the CAS of N777TY with the main gear WOW switches in the ground mode, with the ground spoilers armed, with airspeed signals above 60 knots, and the radio altimeter above 150 feet, the CAS showed the following messages: GND Spoiler (red); WOW Fault (amber); and WOW Fault (blue). (See the copy of the Summary Report of Results of the Ground Test of Gulfstream G-V S/N 508, N777TY, an attachment to this report).

A transcript for the flight was prepared from the Cockpit Voice Recorder (CVR), by Gulfstream.

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Narrative (Continued)

Voice data from the CVR was recorded on four channels; area microphone, pilot, copilot and observer position. The only absent conversation from the area microphone was communications outside the aircraft to air traffic control agencies such as approach control and tower. Those communications were recorded on the pilot and copilot channels, and added to the area microphone transcript from the first download of the area microphone. Since the pilots did not have "hot mic" selected, only the area microphone provided a recording of intra cockpit pilot conversation. The time display for the recordings was not synced to GMT. Each downloaded CVR channel has its own relative time depending on where the start point for download was initiated. Relative time between channels is set based on common events of discussion. In reading the transcript, the time column shows a different relative time for the flight's conversation for those voice transmissions that were not available on the area microphone recording. The CVR recording began with the crew preflighting the aircraft for flight and ends with battery switches selected to off following engine shutdown after landing. (See the copy of the Cockpit Voice and Flight Data Recorder, an attachment to this report).

At the time the accident according to the Gulfstream Aerospace G-V Airplane Flight Manual (AFM) procedure for WOW fails to shift to air mode after takeoff was:

1. Check Flight Controls Synoptic to determine which WOW signal failed.
2. Appropriate WOW CB.....Pull
Left WOW: "POP, C-1Right WOW: CPOP, C-1"


After Landing:


3. Speed Brakes.....Extend
4. Reinstate WOW CB to regain ground mode.


Note: Once below 50 knots, airplane WOW will shift the GROUND mode.

The reported weather for PBI at 0653 was; winds 330 at 6 knots, visibility 10 sm, light rain, 3,000 scattered, 9,000 overcast, temperature 59 degrees F, dew point 55 degrees F, and the altimeter was 30.02 inches Hg.

The airplane was released to Mr. John Hong Principle Advisor for Business Affairs, on behalf of the owner, on April 16, 2002.

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Landing Facility/Approach Information					
Airport Name West Palm Beach Int.	Airport ID: KPBI	Airport Elevation 19 Ft. MSL	Runway Used 27R	Runway Length 7989	Runway Width 150
Runway Surface Type: Asphalt					
Runway Surface Condition: Dry					
Type Instrument Approach: ILS-complete					
VFR Approach/Landing: Full Stop; Precautionary Landing					
Aircraft Information					
Aircraft Manufacturer Gulfstream Aerospace		Model/Series G-V		Serial Number 508	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 10	Certified Max Gross Wt. 90900 LBS	Number of Engines: 2		
Engine Type: Turbo Fan	Engine Manufacturer: BMW Rolls-Royce	Model/Series: BR700-710A1-1	Rated Power: 14750 LBS		
- Aircraft Inspection Information					
Type of Last Inspection AAIP	Date of Last Inspection 01/27/2002	Time Since Last Inspection 1945.6 Hours	Airframe Total Time 1945.6 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? Yes	ELT Operated? No	ELT Aided in Locating Accident Site? No			
Owner/Operator Information					
Registered Aircraft Owner BB Five Inc.		Street Address 1209 N Orange St.			
		City Wilmington	State DE	Zip Code 19801	
Operator of Aircraft Same as Reg'd Aircraft Owner		Street Address Same as Reg'd Aircraft Owner			
		City	State	Zip Code	
Operator Does Business As:			Operator Designator Code:		
- Type of U.S. Certificate(s) Held: None					
Air Carrier Operating Certificate(s):					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 91: General Aviation					
Type of Flight Operation Conducted: Positioning					
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First Pilot Information																																																																																				
Name		City		State	Date of Birth	Age																																																																														
On File		On File		On File	On File	58																																																																														
Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot			Certificate Number: On File																																																																															
Certificate(s): Airline Transport; Flight Instructor																																																																																				
Airplane Rating(s): Multi-engine Land; Single-engine Land																																																																																				
Rotorcraft/Glider/LTA: None																																																																																				
Instrument Rating(s): Airplane																																																																																				
Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine; Instrument Airplane																																																																																				
Type Rating/Endorsement for Accident/Incident Aircraft? Yes				Current Biennial Flight Review? 08/31/2001																																																																																
Medical Cert.: Class 1		Medical Cert. Status: Valid Medical--w/ waivers/lim.			Date of Last Medical Exam: 11/12/2001																																																																															
<table border="1"> <tr> <th rowspan="2">- Flight Time Matrix</th> <th rowspan="2">All A/C</th> <th rowspan="2">This Make and Model</th> <th rowspan="2">Airplane Single Engine</th> <th rowspan="2">Airplane Multi-Engine</th> <th rowspan="2">Night</th> <th colspan="2">Instrument</th> <th rowspan="2">Rotorcraft</th> <th rowspan="2">Glider</th> <th rowspan="2">Lighter Than Air</th> </tr> <tr> <th>Actual</th> <th>Simulated</th> </tr> <tr> <td>Total Time</td> <td>13280</td> <td>1227</td> <td>2423</td> <td>10772</td> <td>2468</td> <td>2040</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pilot In Command(PIC)</td> <td>10279</td> <td>1180</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Instructor</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 90 Days</td> <td></td> <td>67</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 30 Days</td> <td></td> <td>36</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 24 Hours</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air	Actual	Simulated	Total Time	13280	1227	2423	10772	2468	2040					Pilot In Command(PIC)	10279	1180									Instructor											Last 90 Days		67									Last 30 Days		36									Last 24 Hours										
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Seatbelt Used? Yes		Shoulder Harness Used? Yes		Toxicology Performed? No		Second Pilot? Yes																																																																														
Flight Plan/Itinerary																																																																																				
Type of Flight Plan Filed: IFR																																																																																				
Departure Point		State	Airport Identifier	Departure Time	Time Zone																																																																															
Same as Accident/Incident Location			PBI	0640	EST																																																																															
Destination		State	Airport Identifier																																																																																	
Teterboro		NJ	TEB																																																																																	
Type of Clearance: IFR																																																																																				
Type of Airspace: Unknown																																																																																				
Weather Information																																																																																				
Source of Briefing: National Weather Service																																																																																				
Method of Briefing: Telephone																																																																																				


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			Occurrence Type: Accident		

Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
PBI	0653	EST	19 Ft. MSL	NM	Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			3000 Ft. AGL	Condition of Light: Dawn	
Lowest Ceiling: Overcast			9000 Ft. AGL	Visibility: 10 SM	Altimeter: 30.12 "Hg
Temperature: 15 °C		Dew Point: 13 °C	Wind Direction: 330		Density Altitude: Ft.
Wind Speed: 6		Gusts:	Weather Conditions at Accident Site: Visual Conditions		
Visibility (RVR): Ft.		Visibility (RVV) SM	Intensity of Precipitation: Light		
Restrictions to Visibility: None					
Type of Precipitation: Rain					

Accident Information					
Aircraft Damage:		Aircraft Fire:		Aircraft Explosion	
Classification:					
- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -				2	2
Other Ground					
- GRAND TOTAL -				2	2

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	Occurrence Type: Accident	
Administrative Information		
Investigator-In-Charge (IIC) Alan J. Yurman		
Additional Persons Participating in This Accident/Incident Investigation: Frank Donovan Aviation Safety Inspector FAA Fort Lauderdale FSDO Fort Lauderdale, FL 33315		
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